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# Impact of a New Discovery Service at Li Ka Shing Library

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## Abstract

At the Li Ka Shing Library, an evaluation of discovery systems was done with one system selected and implemented in a short time frame. The evaluation and the implementation were described. A survey to measure user satisfaction with the new discovery service was conducted and the results analyzed. Based on the results of the survey, the actions taken by the Library to improve the discovery service were discussed. The usage of electronic resources was compared pre- and post-implementation of the discovery system.

**Keywords:** Discovery service, web-scale discovery, one-stop search, user satisfaction, survey

## Introduction

As part of the Digital Library Project at the Singapore Management University Li Ka Shing (LKS) Library, a number of Innovative Interfaces Inc. modules were put in place since 2008. Encore was the discovery layer that included items in the catalogue and it also harvested items from our institutional repository. Encore Synergy provided a separate “Articles” tab for users to discover articles from a list of major multidisciplinary sources like Ebscohost, JSTOR, and Proquest. The results from each source were displayed on a separate page and the user needed to click on a link in the list of sources to see

the article results from the specific source. The Innovative Electronic Resource Management module is used to manage the subscribed databases. Ebscohost AtoZ is used to manage the electronic journals.

The Library staff did not hear major complaints from the students about the digital library but we did encounter students who were not sure which database to start their search and students who did not like to try a number of databases with each having different results.

The Library was considering enhancements to the digital library and decided to do a survey to determine the needs of our users.

## **Survey of User Satisfaction with PYXIS**

For the survey, questions about satisfaction with PYXIS (which is the name of our digital library with Encore as the discovery layer) were asked. The original intention was to ask what kind of SMS services and mobile services the users would like to have added. A question on the importance of a single search interface was included in the survey.

The survey was run in January 2012. At the end of the survey, there were 88 respondents. Table 1 showed the results of selected questions from the survey.

For the question: “How important to have one integrated search?” the sum of the responses for “Important” and “Very important” was 86.4%, with 61.4% rating it as “Very important”. This was a high percentage of the respondents rating that it was important to be able to search for articles, journals, books and other materials via one integrated search.

It was found that 47.7% of the users found PYXIS “Easy” and “Very Easy” to search, with only 4.5% in the “Very Easy” category. The “Somewhat Easy” category had 42% of the responses. This indicated that the users were not finding it that easy to use the digital library to find what they needed.

The percentage of users who rated their satisfaction with PYXIS as “Satisfied” (56.8) and “Very Satisfied” (11.4) was 68.2. The highest number of responses was for “Satisfied” (56.8%) followed by “Somewhat Satisfied” (29.5%). This indicated that the users were mostly satisfied but only a smaller number were very satisfied.

Table 2 showed that 77% of the respondents were undergraduates, 4.6% postgraduates, and 11.5% faculty.

**Table 1: PYXIS Survey January 2012 Results**

Question \ Percentage	Not Useful	Somewhat Useful	Useful	Very Useful	Useful & Very Useful
Do you find the 3 articles inserted in the Catalogue results useful?	10.2	37.5	46.6	5.7	52.3
	Not Important	Somewhat Important	Important	Very Important	Important & Very Important
How important is the ability to find articles, journals, books and other materials in one integrated search?	1.1	12.5	25	61.4	86.4
	Not Easy	Somewhat Easy	Easy	Very Easy	Easy & Very Easy
From starting your search to actually finding what you need, how easy is the process?	10.2	42.0	43.2	4.5	47.7
	Not satisfied	Somewhat satisfied	Satisfied	Very satisfied	Satisfied & Very satisfied
How would rate your satisfaction with PYXIS?	2.3	29.5	56.8	11.4	68.2

**Table 2: Respondent Profile in January**

Undergraduate	Postgraduate	Faculty	Research staff	Administrative staff
77.0%	4.6%	11.5%	2.3%	4.6%

## Better Discovery Service Needed

The results of the survey gave the Library an impetus to try out a different discovery service. There were more vendors in the arena in 2012 compared to

2008 keen to promote their product and some were able to provide trials. It was a good time to try out the other discovery services.

As defined by Vaughan (2012, p. 7), a web-scale discovery is “*a pre-harvested central index coupled with a richly featured discovery layer that provides a single search across a library’s local, open access, and subscription collections.*”

The survey results showed that there was a demand for a single search box and provided some support for Breeding (2010, p. 33, 34) who proposed that:

*“Users might be better served through a more unified approach in the way that it delivers access to all these different areas of content. To the largest extent feasible, the library’s web presence should offer users a seamless experience that presents a consistent interface, despite the use of multiple technology and content products behind the scenes. ... A great discovery interface should operate in a mostly self-explanatory way, allowing users to concentrate on selecting and evaluating the resources returned rather than struggling through the search tools that the library provides.”*

A project team was formed to evaluate and implement a suitable discovery service by July 2012 in time for the start of the new academic year. The team members were:

- Ryun Lee (Metadata Librarian)
- Siti Nurhidayah (Library Specialist, Serials)
- Sun Shengbo (Digital Library Specialist)
- Xia Wei (Research Librarian, Information Systems)
- Yeo Pin Pin (Head, Information Services)
- Yuyun Wirawati (Research Librarian, Web)

Trials for EBSCO Discovery Service (EDS) and Summon were arranged and links added to the Library website from February 2012. The vendor for Primo was not able to provide a trial but they provided some existing customer sites.

Hoeppepner (2012) highlighted that index records in the central index may vary between services and evaluated key areas like branding, searching and facets. Cai, Dou and Jiang (2011) identified other keys areas to evaluate: resource coverage, metadata quality, and user interface. Aymonin, Borel, Grolimund, Guignard, Iffland, & Walter (2011) emphasized simple and powerful search capabilities for the user and yet remain simple to maintain from a system administration point of view. In their evaluation, the availability of permanent

links was specifically commented upon. The team talked to the staff at other libraries in Singapore who were implementing or had implemented a discovery service. With the valuable feedback from the libraries in Singapore and the literature review, the team came up with a list of evaluation criteria.

Each team member used the discovery systems trials and completed one worksheet to rate each system using the evaluation criteria. The individual ratings were added to give a total score. The team agreed that some criteria were more important and that it needed to be reflected in the score. Different weights were assigned to the major criteria and a total score for each system was derived.

The total scores were quite close but one system did emerge with the highest score. The system that had the highest score was EBSCO Discovery Service (EDS). The team wrote an evaluation report and submitted it to the University Librarian. The report was accepted and the next phase of implementation was started.

The vendor provided training on EDS for the library staff with additional training on EDS Administrative Module for the project team. Nearer to the launch date of EDS, another round of training for the library staff was done by a project team member.

As more users tried out the new service, they also asked questions. The repeated questions were turned into FAQs on the library website. The library staff was alerted to issues as they surfaced and also the solutions or answers. This was done via email and at staff meetings.

## **Promotion of Discovery Service**

With the implementation of EDS in early July 2012, the EDS search box replaced the Encore search box on the library website. A student assistant was engaged to design a new logo for the discovery service which was named PYXIS+. In consultation with library staff and some students, it was decided to keep the name PYXIS as it was recognized as a brand of the Library and that the “+” would be sufficient to show that there was a change to the old discovery layer.

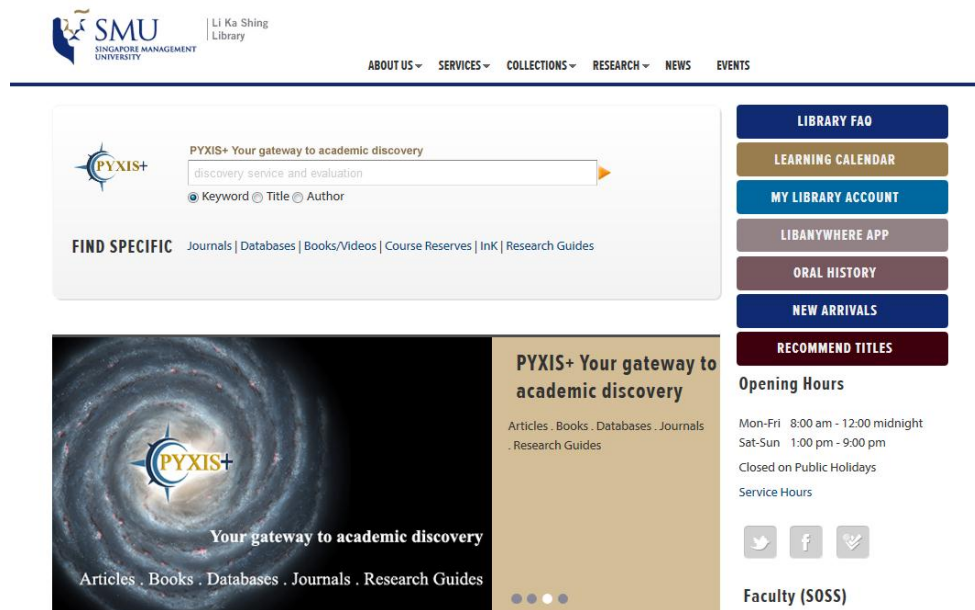
The librarian who was the library webmaster amended the design of the PYXIS+ search box. The search box would appear in the library website and also as a widget in our research guides. The corporate website was also undergoing a re-vamp which had implications for the library website. Both the changes in the search box and the library website came together in a brand new look as seen in Figure A. Announcements for PYXIS+ was sent to the SMU community via email and posters were designed to highlight the new discovery system.

It was planned to showcase PYXIS+ in the library orientation organized at the end of July 2012. There were reservations from the librarians who would be conducting the orientation as they were still not fully familiar with PYXIS+ and they also had concerns about teething problems with a new system. However, it was a wonderful opportunity to introduce all the new undergraduates to the new PYXIS+ and all the members of the Learning Services team decided to go ahead with incorporating it into the library orientation. There were a few hiccups as the librarians tested the orientation activities. The problems were reported to the vendor. The librarians also thought of alternative solutions for the problems. The vendor's staff and library staff worked hard to ensure that the problems were resolved in time for the library orientation.

In the subsequent months as the term started, the librarians demonstrated PYXIS+ together with other relevant databases at every training opportunity they had. The audience the librarians reached was made up of mostly Year 1 and Year 2 students.

The Library had a "Welcome Tea" for students in the beginning of the term, after the library orientation programme. One of the activities during the tea was the launch of PYXIS+ with a cake emblazoned with the PYXIS+ logo. It reinforced the idea of the new discovery service to the students.

**Figure A: New Library Website with PYXIS+ Search Box**



## PYXIS+ User Satisfaction Survey October 2012

The users were given some time to use the new discovery service, named PYXIS+. A survey with three key questions was launched in October 2012. At the end of the survey, there were 436 respondents.

**Table 3: Respondent Profile in October**

1st Year Undergraduate	2nd to 4th Year Undergraduate	Postgraduate	Faculty	Research staff	Administrative staff
50.7%	38.7%	4.2%	3.9%	0.5%	2.1%

As seen in Table 3, 89.4% of the respondents were undergraduates, with 4.2% postgraduates, 3.9% faculty and 2.6% other staff. The undergraduates were asked to indicate if they were First Year undergraduates (50.7%) or Second to Fourth Year undergraduates (38.7%).



**Table 4: PYXIS+ Survey October 2012 Results**

Question \ Percentage	Not satisfied	Somewhat satisfied	Satisfied	Very satisfied	Satisfied & Very satisfied
How well does PYXIS+ satisfy your need to find articles, journals, books and other materials from one search box?	6.7	17.2	53.4	22.7	76.1
	Not Easy	Somewhat Easy	Easy	Very Easy	Easy & Very Easy
From starting your search to actually finding what you need, how easy is the process?	10.8	28.7	46.1	14.4	60.5
	Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied	Satisfied & Very Satisfied
How would rate your satisfaction with PYXIS+?	4.8	14.4	61	19.7	80.7

Table 4 showed the results for the three questions asked. The users were 76.1% “Satisfied” and “Very Satisfied” in their need to find articles, journals, books and other materials from one search box.

In comparison with the results in the January survey, the Library did much better in user satisfaction as seen in Table 5. The percentage of users who were “Very Satisfied” increased from 11.4 to 19.7, and the percentage of users who were “Satisfied” increased from 56.8 to 61.0 to bring the sum of “Satisfied” and “Very Satisfied” to 80.7%, compared to 68.2% in January. This was an increase of 12.5 percentage points.

**Table 5: Comparison of Overall Satisfaction**

How would rate your satisfaction with PYXIS+?	Not Satisfied %	Somewhat Satisfied %	Satisfied %	Very Satisfied %	Satisfied & Very Satisfied
January survey	2.3	29.5	56.8	11.4	68.2
October survey	4.8	14.4	61.0	19.7	80.7

For the question on how easy was the search process, the percentage of users who found it “Very Easy” increased from 4.5 to 14.4. The sum of “Easy” and “Very Easy” ratings in October was 60.5 compared to 47.7 in January as seen in Table 6. This was an increase of 12.8 percentage points.

**Table 6: Comparison of Ease of Search Process**

From starting your search to actually finding what you need, how easy is the process?	Not Easy	Somewhat Easy	Easy	Very Easy	Easy & Very Easy
January survey	10.2	42.0	43.2	4.5	47.7
October survey	10.8	28.7	46.1	14.4	60.5

The two largest groups of respondents were First Year Undergraduates (220) and Second to Fourth Year Undergraduates (167). The survey results were filtered to these two groups and the responses shown in Table 7. The other respondents (postgraduates, faculty and staff) were not filtered as the sample sizes were small.

**Table 7: PYXIS+ Survey October 2012 by Respondent**

Question \ Percentage	Not satisfied	Somewhat satisfied	Satisfied	Very satisfied	Satisfied & Very satisfied
Q.1 How well does PYXIS+ satisfy your need to find articles, journals, books and other materials from one search box?					
Overall	6.7	17.2	53.4	22.7	76.1
Undergraduates Yr1	2.7	12.7	60.5	12.7	73.2
Undergraduates Yr2-4	12.0	23.4	43.7	21.0	64.7
Q.2 From starting your search to actually finding what you need, how easy is the process?	Not Easy	Somewhat Easy	Easy	Very Easy	Easy & Very Easy
Overall	10.8	28.7	46.1	14.4	60.5
Undergraduates Yr1	6.8	23.6	53.2	16.4	69.6
Undergraduates Yr2-4	16.8	35.9	35.9	11.4	47.3
Q.3 How would rate your satisfaction with PYXIS+?	Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied	Satisfied & Very Satisfied
Overall	4.8	14.4	61	19.7	80.7
Undergraduates Yr1	1.8	9.1	65.0	24.1	89.1
Undergraduates Yr2-4	9.6	18.6	57.5	14.4	71.9

There appeared to be a difference in the responses from First Year undergraduates and Second to Fourth Year undergraduates. As the sample sizes of the two groups were different, Welch's t-test was used to test the hypothesis that there was a significant difference in the responses against the null hypothesis that there was no significant difference in the responses. For all three questions as shown in Table 8, the  $p$  was less than 0.1, hence the hypothesis that the responses from the two groups was significant was accepted. For Question 2 and 3, the  $p$  was very small ( $< 0.001$ ) and was a very strong indicator that the responses for the two groups were different.

**Table 8: Mean, Variance, t-test for Undergraduates Responses**

		Mean	Variance	Welch t-test	$p$
Q.1	Undergraduates Yr1	2.74	0.86	1.55	0.06
	Undergraduates Yr2-4	2.6	0.46		
Q.2	Undergraduates Yr1	2.78	0.62	4.19	<.001
	Undergraduates Yr2-4	2.42	0.81		
Q.3	Undergraduates Yr1	3.11	0.39	4.54	<.001
	Undergraduates Yr2-4	2.78	0.66		

From Table 7 and 8, it can be concluded that the Second to Fourth Year undergraduates were less satisfied with PYXIS+ (Q.3) compared to the First Year undergraduates. The Second to Fourth Year undergraduates did not find it so easy to search using PYXIS+ (Q.2). Although they rated that they were 64.7% "Satisfied" and "Very Satisfied" with PYXIS+ to find materials from one search box, compared with 73.1% for First Year undergraduates, the difference was significant if  $p < 0.1$  but not significant if  $p < 0.05$ . The difference was understandable as the Second to Fourth Year undergraduates were used to the previous digital library and were not familiar with the new PYXIS+.

## Analysing the Comments

The results of the survey were shared with the SMU community in November. Although the ratings were very good, the users provided feedback on some issues they had with using PYXIS+. A total of 90 usable comments were

received out of 155 comments as the remainder were not usable having responses such as Nil, NA.

Some of the positive comments were:

- I think it has become a lot more user-friendly as compared to the previous version. Great job!
- Faster and a lot easier to navigate!!! I had trouble working with the older system sometimes.
- Makes it extremely easy to search for content across all of the libraries resources, rather than having to log into individual databases separately.

Some of the negative comments were:

- The articles might load very slowly sometimes.
- There are a number of sources that did not provide full text articles.
- I guess there should be subject categories.
- Allow for one time login and keep user logged onto the system.

The highest number of comments was about seeing results for items that the Library had no access to the full text. The second highest number of comments was about the slow speed.

There were also users that preferred the old platform. For users who knew what they were looking for, they preferred to search for books and articles separately. Some users also did not like the large number of results and found it difficult to filter to what they needed.

The separate sign-in for EDS also confused many users. They were expecting to login with their university identity and password both at the EzProxy prompt and in the EDS platform. Many did not want to create a separate account and to have another set of id and password to remember.

The feedback has been shared with the vendor and it is hoped that it will contribute to future enhancements in EDS.

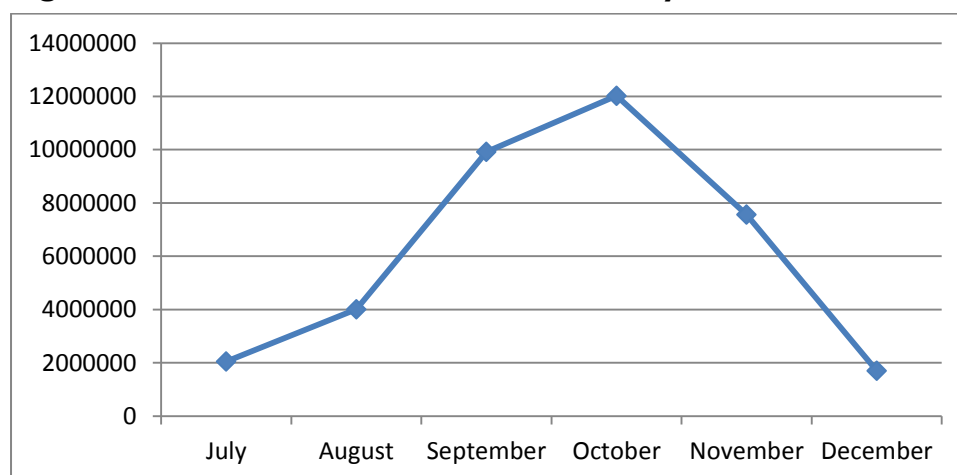
As a result of the comments, EDS was tweaked to limit by default to only items that were available in the library collection or items that the library had access to full text. Some users did not see the links to external full text as they did not have the PDF icons. A request was lodged with the vendor to insert a

PDF icon for external full text links. This would make the availability of full text more consistent to the user by using the PDF icon for both full text in EDS and full text in external sources. The changes made were announced to the SMU community in December.

## Usage of PYXIS+

The usage of PYXIS+ was tracked using the administrative module in Ebsco, as shown in Figure B. Over the period July to December 2012, the total number of searches was over 3.7 million and the number of full text downloads was over 140,000. The pattern of usage follows the pattern of the term with usage peaking in October when the students start working on their assignments and tapering off in the vacation period of December.

**Figure B: Number of Searches in PYXIS+ by Month**

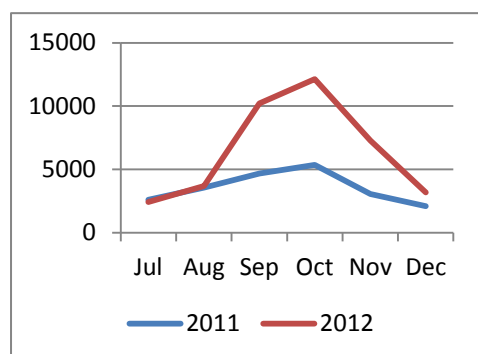


Baldwin, Kucsak and Eng (2012) looked at database usage and specifically full text downloads before and after the discovery service was implemented at their library. They found that “after the discovery tool was implemented we saw a major increase in full text downloads. In the first full quarter of operation, the four most expensive databases were up over 50% in full text downloads compared to the same time period the previous year without web scale.”

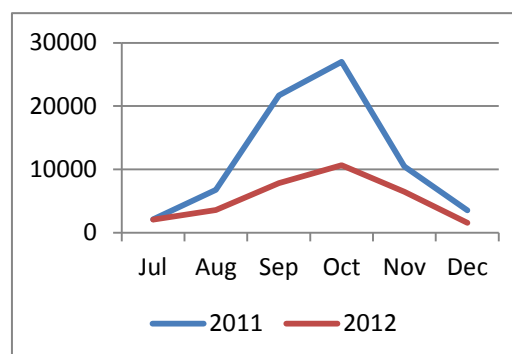
The situation in Li Ka Shing Library was also monitored. In the case of database A (see Figure C), the full text downloads in the period July to December 2012 had increased by 82% compared to the same period in 2011. In the case of database B (see Figure D), the full text downloads in the period

July to December 2012 had decreased by 55% compared to the same period in 2011.

**Figure C: Full Text Downloads from Database A**

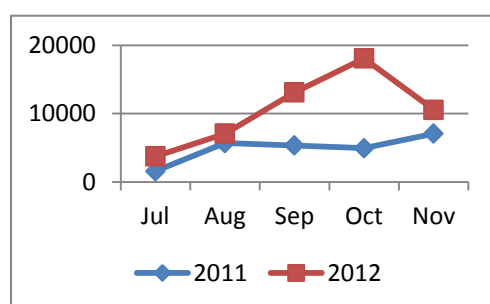


**Figure D: Full Text Downloads from Database B**

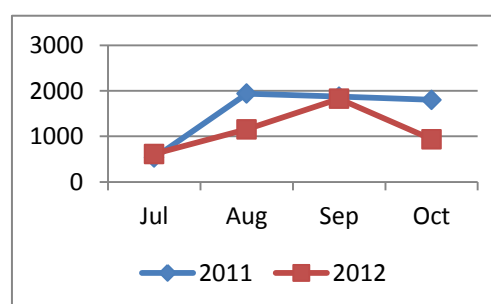


In the case of e-book database C (see Figure E), the full text downloads in the period July to November 2012 had increased by 100% compared to the same period in 2011. In the case of e-book database D (see Figure F), the full text downloads in the period July to October 2012 had decreased by 25% compared to the same period in 2011.

**Figure E: Full Text Downloads from E-book Database C**



**Figure F: Full Text Downloads from E-book Database D**



Hence it can be seen that the impact of the discovery service on usage in the Library was significant in these four databases. For these databases, the impact can be positive or negative. In the future, as more usage data is collected from more databases, it would be useful to study the impact of the discovery service on usage of library resources.

## Conclusion

The evaluation and implementation of the discovery service was achieved in a short time period at the Li Ka Shing Library. It was found that the overall satisfaction with the discovery service was higher after the new discovery service was implemented. From the user feedback, some changes were made to better meet the needs of the users. The impact of the discovery service on the usage of databases could be positive or negative and would need more data and longer time series data for further analysis.

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